

The Saturday Gazette.

BLOOMFIELD AND MONTCLAIR.

WILLIAM P. LYON, Editor and Proprietor.
CHARLES M. DAVIS, Associate Editor.

OFFICE:
Bloomfield, N. J.

AN INDEPENDENT WEEKLY JOURNAL OF LITERATURE, EDUCATION, GENERAL NEWS AND LOCAL INTERESTS. \$2.00 A YEAR—IN ADVANCE

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THE
SATURDAY GAZETTE,
BLOOMFIELD AND MONTCLAIR.

AN INDEPENDENT WEEKLY JOURNAL
OF LITERATURE,

EDUCATION,
POLITICS,
GENERAL NEWS,
AND LOCAL INTERESTS.

It is generally acknowledged to be the equal of the best newspapers published and superior to most country papers. It is a matter of pride to these towns which it so ably and well represents. To sustain these assertions, it would be easy to give a large selection from opinions of its readers and patrons which constantly come to hand. But the paper will speak for itself.

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April 19.—
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OF NEWARK, NEW JERSEY.

THIS Institution commenced business on the 24th of February last, in the Rhodes Building, No. 443 Broad Street, nearly opposite the M. & E. R. R. Depot. It is very conveniently located for residence of Bloomfield, Montclair and vicinity who may desire to have banking facilities in Newark.

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Reliable Agents Wanted.—To those who will give their whole time to the business, liberal terms will be granted. may31-17

PEOPLES

Savings Institution,

445 BROAD STREET, NEWARK, N. J.

APRIL 15th, 1874

At a meeting of the Board of Managers held this day, a dividend at the rate of

PER CENT PER ANNUM FREE OF ALL TAXES

was declared on all deposits entitled thereto on the first of May, payable on and after May 15th.

Interest not drawn will be credited as principal from May 1st. Deposits made on or before May 2d, will draw interest from May 1st.

This Institution will remove on or about April 25th to its new Banking room, number 445 Broad St., under the Continental Hotel.

H. M. RHODES, President.

Wm. N. RANDALL, Treasurer

LEGAL ADVERTISEMENTS.

SEALED PROPOSALS

Will be received by the subscriber, until 7 o'clock P. M., May 8, 1874, for the working and grading of Union St. Montclair, from Fairlawn Ave., west to Mountain Ave.—about 6,000 cubic yards of dirt to be moved—according to plans and specifications to be seen at my residence in Montclair. The Town Committee of Montclair hereby reserves the right to reject any or all bids, as they may deem best for the interest of the Township.

Signed,
E. T. GOULD.

For the Town Committee of Montclair.

May 2

MASTER'S SALE.

IN CHANCERY OF NEW JERSEY

Between Abram S. Hewitt, Complainant and The Montclair Railway Company, and others, Defendants. F. F. for sale of mortgaged premises.

The Sale under the above stated writs is adjourned to Saturday, 24th May 1874, at Taylor's Hotel, in Jersey City, at 2 o'clock, P. M.

WILLIAM PATTERSON,

Master in Chancery of N. J.

may31-17

COMMISSIONER'S SALE OF REAL ESTATE.

THE Subscribers, Commissioners appointed by the Orphan's Court of Essex County by an order of said Court made on the 24th day of March last, will sell at Public Vendue to the highest bidder, on Tuesday the second day of June next, at two o'clock in the afternoon on the premises, all those tracts or parcels of land situated in Bloomfield, Isle of Henry J. Davis, deceased. The first tract three lots situated on Vine Street and are respectively seventy-five, sixty-five and forty feet wide and one hundred and fifty feet deep, on the other side, one lot on the easterly line of Hickory Street, fifty feet wide and about one hundred feet deep, also two alleys adjoining of ten feet wide, one lot on the west side of Hickory Street about fifty feet wide and about eighty nine feet deep, and also on the east side and adjoining the town of Morris Canal and running northerly about five hundred and four feet to land of Michael Hickory, easterly along his line about seventy two feet to Hickory Street, southerly along the same sixty feet to Vine Street, southerly thence southerly along the same two hundred and thirty two feet to land now or formerly of D. C. Hayes, thence westerly along the same seventy feet to the said town-path and place of Beginning.

Dated Bloomfield May 1st, 1874.

WILLIAM M. HALL,

SMITH E. FERRY,

Commissioners.

GUARDIAN SALE.

IN CHANCERY OF NEW JERSEY.—In the matter of the Estate of Robert M. Heming, Guardian of Alfred E. De Laze, a Lunatic, for the sale of Real Estate—an order for sale.

Thursdays of property in the above stated matter, is adjourned to the above stated date.

THURSDAY, 7th day of MAY.

At the same hour on the tract of land first described in the advertisement thereof, bought of William Heming by deed recorded in Book 12, of Deeds, for Essex County, on page 175.

R. M. HENNING,

Guardian.

April 9, 1874

SMITH & TOWNLEY.

WHOLESALE DRUGGISTS,

AND DEALERS IN

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May 3-bum

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NEWARK, N. J.

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nov15-17

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Practical Hatter,

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To suit all ages. The

BROADWAY DRESS RILE HAT,

a specialty. Constantly on hand and made to order by a practical workman, at prices that cannot fail to please. \$4.50, \$5.00, \$5.50, \$6.00, Super-Extra Fine, \$7.00.

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441 BROAD STREET,

Opposite M. & E. R. R. Depot.

First class goods of the latest styles now ready.

April 9-17

Educational

For Saturday Gazette.

SPECTRUM ANALYSIS.

The words Spectrum Analysis have so learned a sound that most persons would at once conclude that the subject was only to be understood by scientific people, and pass them by as not suited for the general reader, but this discovery of the present generation has so enlarged our knowledge of the universe that a plain description of what it is, will be read with pleasure by every one not only for its novelty, but for the marvelous results that have been reached with the simplest instruments. The wonders that it has shown to our sense of sight about regions of space at enormous distances from our earth are the results of the labors of patient and devoted thinkers, dwelling upon a few well-known facts of nature, the magician's wand that has ranged in order before our eyes, the constant elements of the sun and even swept the fixed stars within our knowledge is a simple piece of glass shaped like a three-cornered file, the prism. The view of Light, now accepted, is that an ether pervades all space between the various planets and stars, like the air that we live in, but vastly more rarified and subtle.

At all events, it moves in undulations or waves as any other gas does, and these waves cause vision, when they strike upon the eye, as in other cases waves of air striking the ear produce sound. As waves of sound of diverse lengths produce diverse sounds, so do those of sight diverse colors.

The prism enables us to separate the waves moving with the same velocity which are of different lengths. Those having the shortest wave length, on meeting the resistance of the glass of the prism are turned aside from their direct course more than the longer ones. To try this, let a beam of light into a dark room through a hole of 1-8 inch diameter and let this beam pass through the prism. The emanation delays it and releases it no longer a simple ray of pure white light but disclosing that its substance held concealed a series of beauties that as they struggle to escape show a successive splendor of red, orange, yellow, green, blue and violet, beyond which some subtle ones escape invisible. These, the actinic rays, are those that photography captures and which average themselves on unwary men in sun strokes. The violet ray that appears at one end of the spectrum, as the divided ray of light is called moves with 800 billions of vibrations in one second, the red ray with 450 billions, and the others with velocities between these two. The lovely violet that often clothes the earth at sunset moves with nearly twice the activity of the massive red rays. We cannot divide up any one of these colored rays by passing it alone through another prism, and these are therefore considered to be primitive colors. Yet, as the range of vibrations is unlimited, there may be colors which our sense of sight is not capable of perceiving.

Having now a key which unlocks the treasures of color, before using it further let us examine the cause of color in the objects around us, a step that will imperceptibly bring us near to the key to the sun's elementary constituents by a path so indirect that its ending is more wonderful than a fairy tale.

Are colors a something inherent in the nature of every substance? A dress that is violet by daylight becomes dull by gas light; or if you mix a little table salt in the wick of a spirit lamp you will find it gives a yellow flame that makes all objects around it seem gray or only dull light and shade. Now remembering the effect the prism had in dispensing the white ray of sun light and supposing that all objects have the same effect to a certain degree only, then a cause for their colors may be imagined. For if any body has the power of separating the white light into its various colored rays and also of absorbing all except one, which it reflects, it will of course appear to the eye of that color; and still further, if it absorbs all the other colors and reflects only one, it will appear black to us when lighted by a flame that does not have that color in it, since it absorbs all other colors and its proper color is not in the flame to be reflected. Try this by taking a piece of blue paper into a dark room and lighting it by the sodium flame of a spirit lamp fixed as mentioned previously. The yellow flame can throw no blue rays upon the paper, and it will appear black. A red paper will not seem quite black as it only partially absorbs the yellow rays. We have now reached a fact that is of importance in what follows, which is, that a colored body shows black when lighted by a flame of the color which the body absorbs. As the point to which we wish to reach is the matter which is to be found in the sun, and which is in the condition of a gas, we will pass by the consideration of absorption by solids and liquids to examine how it affects gases both when they are luminous and non-luminous. A simple instrument to hold the gases is a glass globe or a vessel which has those parts through which the ray of light is to pass parallel and also perpendicular to the ray, and iodine a convenient body to experiment with. A little piece of this will give a beautiful violet vapor with moderate heating of the glass that holds it. By placing a prism close to the glass and then throwing a beam of light through it and looking at the spectrum which is made by it, between the yellow and blue there will appear a dark belt, and any intense light, such as the electric resolves this into a number of fine dark lines, showing that certain rays of light are absorbed in passing through the vapor of the iodine. Most other colored vapors also cause similar dark lines to appear on the spectrum, though some do not. This power of bodies to absorb light and their power of emitting it when heated are similar to their known power to absorb and emit heat, of which those bodies that absorb the most have long been known to emit the most.

In 1860, Kirchhoff collected all previous observations on this subject and announced a law from them which is, that the power of emission of rays compared to that of absorption is the same for all bodies at the same temperature. Here is a law to which all light is subject whether it reaches us from the sun or has been on its journey from the fixed stars since before the deluge. Unity of force and the reign of Law are spread before us, and with them we can test the operations of the visible universe.

We will now examine the spectrum made by the sun more carefully and use instead of one prism a collection of from four to nine, in order to extend the spectrum. This instrument being used with the telescope and the microscope must have a name suited for such scientific society and is introduced as the Spectroscope.

The sun's spectrum when passed through this instrument shows not only the colors that are seen by means of one prism, but in addition a number of black lines, which always keep the same position and relative order. One thousand of these lines have been mapped by the use of elaborate instruments and the spectrum sub-divided into spaces marked with letters for reference. Fraunhofer, who mapped six hundred of these, observed that two of them, which he marked D, occupied the same space in the spectrum as did the two bright lines made by sodium. Kirchhoff first, obtaining a solar spectrum and then bringing a sodium flame in front of the slit so that the sun's ray passed through the sodium vapor by that these D lines became bright by light emitted from the sodium. Next showing the gas light of a Bunsen burner through the sodium, the yellow lines were still emitted, but the direct rays of the sun as also the light of the Drummond were both absorbed by the sodium and the dark spaces showed in the spectrum.

From such an evident connexion between the sodium lines and the D lines of the sun, he proceeded to divide the spectrum so that whilst one half would show the sun's lines the other half would show the lines of any metallic or other vapor by the side of the sun's black lines, in the same way that two sheets of ruled paper may be laid side by side to try whether the lines agree. In this way more than sixty lines made by iron were found to coincide exactly with as many lines in the sun's spectrum, and as the chances that this was accidental were one in many billions, it was announced that the elements of our earth composed the sun. That a German professor armed with a piece of glass should summon the sun 95 millions of miles distant to give an account of its constituents seemed rather the work of spiritual agencies than of earthly ones. Daring and ingenious man, striving to reach the heavens and not resting in the sun, pursued a career in boundless space, questioning the planets and fixed stars and finally determining the qualities of the nebula which had baffled the gigantic instruments of Herschel and Lord Rosse.

But whilst so part of the visible universe has been left unexamined, the greatest interest has centered in new discoveries in the sun, and the material of which it is composed forms but a small part of the knowledge now acquired of its atmosphere, its daily changes, and of its tremendous hurricanes, even the velocity of which, as well as their extent, are known, and whether they are advancing or receding from us.

The first theory of the condition of things on its surface was that a central mass of intense temperature, composed of all the various minerals, was surrounded by vapors of the same substances of lower temperature and that these absorbed each its special ray, so that the light as it reached us showed the various black lines in the spectrum due to this cause, and to confirm or contradict this a total eclipse which shut off the direct light of the central mass, and thus all in the vapors only of the sun was examined, was looked forward to with such interest that national expeditions were sent to various parts of the earth

to hold the gases is a glass globe or a vessel which has those parts through which the ray of light is to pass parallel and also perpendicular to the ray, and iodine a convenient body to experiment with. A little piece of this will give a beautiful violet vapor with moderate heating of the glass that holds it. By placing a prism close to the glass and then throwing a beam of light through it and looking at the spectrum which is made by it, between the yellow and blue there will appear a dark belt, and any intense light, such as the electric resolves this into a number of fine dark lines, showing that certain rays of light are absorbed in passing through the vapor of the iodine. Most other colored vapors also cause similar dark lines to appear on the spectrum, though some do not. This power of bodies to absorb light and their power of emitting it when heated are similar to their known power to absorb and emit heat, of which those bodies that absorb the most have long been known to emit the most.

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